Amendments to the Claims

This listing will replace all prior versions and listings of claims in the application:

Listing of Claims

1. (Currently amended) A bovine beta-casein gene targeting vector comprising, in operable association,

(1) a first nucleic acid region having a length of about 6 kb which ~~is homologous to~~ comprises the promoter and its flanking nucleic acid sequences of a bovine beta-casein gene, and further comprises ~~comprising~~ exon 1, intron 1, and exon 2 of a bovine beta-casein gene; (2) a region for cloning a nucleic acid coding for desired proteins; (3) a region for coding a positive selection marker; (4) a second nucleic acid region having a length of 2.8 to 3.5 kb which ~~is homologous to the nucleic acid sequences of bovine beta-casein gene, and comprising~~ comprises exon 5, 6, 7 and 8, and intron 5, 6 and 7 of bovine beta-casein gene; wherein the nucleic acid segment corresponding to the first region is located upstream to the nucleic acid segment corresponding to the second region in the 5' -3' arrangement of beta-casein gene.

2. (Canceled)

3. (Original) The vector according to claim 1, wherein the length of the second region is 3.0 to 3.2 kb.

4. (Original) The vector according to claim 1, wherein the positive selection marker is selected from the group consisting of neomycin (Neo) , hygromycin (Hyg) , histidmol dehydrogenase gene (hisD) and guanine phosphosribosyltransferase (Gpt) .

5. (Original) The vector according to claim 1, wherein the vector further comprises a region for a negative selection marker.

6. (Original) The vector according to claim 5, wherein the negative selection marker is Diphtheria toxin (DT) gene.

7. (Canceled)

8. (Canceled)

9. (Canceled)

10. (Currently amended) A method for producing a bovine beta-casein gene-targeted somatic cell which comprises the steps of
(1) introducing the bovine beta-casein gene-targeting vector according to claim 1 or 5 into a bovine ~~embryonic cell or~~ fibroblast cell;
(2) permitting to occur homologous recombination events in the bovine ~~embryonic cell or~~ fibroblast cell; and
(3) selecting the bovine beta-casein gene-targeted bovine embryonic cell or fibroblast cell with a desired gene.

11. (Original) The method according to claim 10, wherein the vector in the step (1) is introduced in form of linearized or deleted form lacking plasmid vector backbone.

12. (Currently amended) A method for generating transgenic ~~cattle~~ bovine which comprises the steps of
(1) introducing the bovine beta- casein gene-targeting vector according to claim 1 or 5 into a bovine ~~embryonic cell or~~ fibroblast cell;
(2) permitting to occur homologous recombination events in the bovine ~~embryonic cell or~~ fibroblast cell;
(3) selecting the bovine beta-casein gene-targeted ~~embryonic cell or~~ fibroblast cell with a desired gene;

(4) introducing the nucleus of the bovine gene-targeted ~~embryonic cell or~~ fibroblast cell into a nuclear-removed bovine oocyte to produce a nuclear-transferred bovine embryo;

(5) activating the embryo; ~~and~~

(6) implanting the embryo into a female bovine recipient; and

(7) permitting the implanted embryo to develop.

13. (Currently amended) A method for obtaining a large scale of desired proteins which comprise the steps of (1) generating transgenic cattle in accordance with the method of claim 12; (2) inducing lactation in the transgenic bovine; (3) collecting milk from the lactating transgenic bovine; and ~~(2)~~ (4) purifying the desired protein from milk of the transgenic cattle.